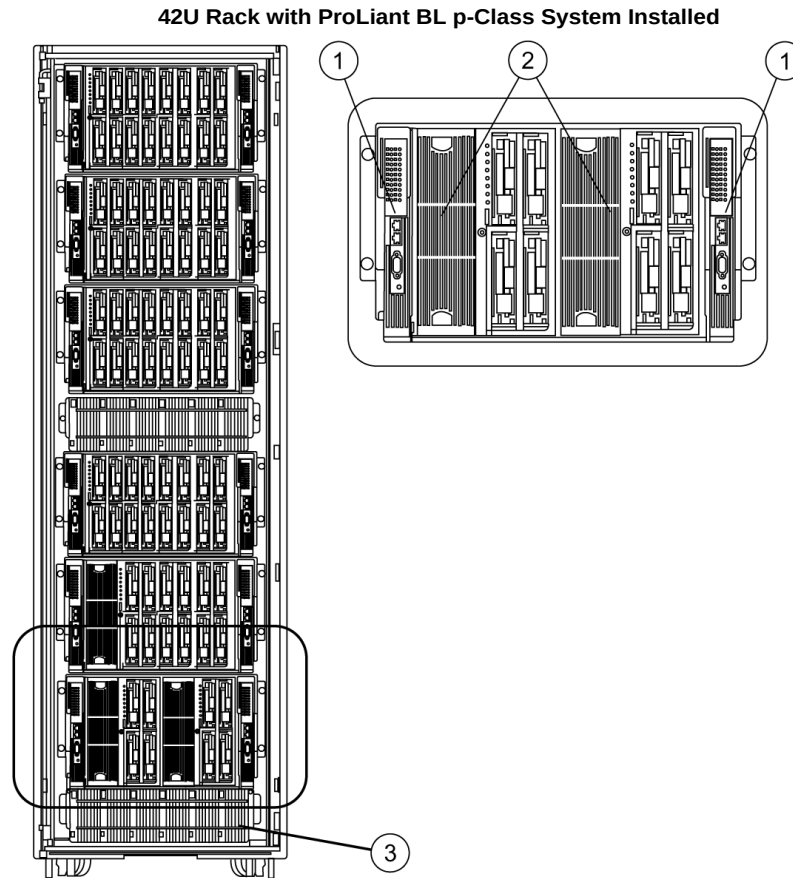


Overview



1. BL p-Class Interconnects (2) in BL p-Class server blade enclosure (interconnect switch shown)
2. BL40p server blades (2) in BL p-Class server blade enclosure
3. BL p-Class power enclosure with hot-plug power supplies (6)

What's New

- New I/O cable with two USB ports, one video port, one iLO port and kernel debug port. The I/O cable attaches to the front of the server blade on the 3.0GHz and 2.2GHz models of the BL40p. The cable was specifically designed to aid in initial server image deployment. The cable ships with all 3.0 GHz and 2.2GHz models.
- Intel® Xeon MP FC-PGA 3.0 GHz/4MB or 2.2 GHz/2MB processor (quad capability)

ProLiant BL40p Server Blade includes:

- Intel Xeon MP FC-PGA 3.0GHz/4MB, 2.2GHz/2MB, 2.8GHz/2MB or 2.0GHz/1MB processor (quad capability)
- ServerWorks GC-LE Chipset
- 512-MB or 1024 MB of 2-way interleaved PC2100 ECC DDR (2 x 1 Interleaved Memory), expandable to 12 GB
- Advanced Memory Protection with Online Spare
- Five NC7781 PCI-X Gigabit NICs (embedded) with WOL (Wake On LAN) and Preboot eXecution Environment (PXE)
- One additional 10/100T NIC dedicated to Integrated Lights-Out (iLO) Management
- Smart Array 5i Plus Controller with battery-backed write cache (integrated on system board) standard on 2.8GHz/2M and 3.0GHz/4M models, optional on 2.0GHz/1M and 2.2GHz/2M models
- Wide Ultra3 SCSI Drive Cage standard supports up to four 1" hot plug hard drives
- Two PCI-X slots (64b/100MHz capable) for redundant SAN connectivity
- Integrated Lights-Out (iLO) Management (ASIC on motherboard)
- Plugs vertically into p-Class server enclosure
- Up to 12 BL40p blades fit in 42U rack

Overview

What's Needed

ProLiant BL p-Class Server Blade Enclosure:

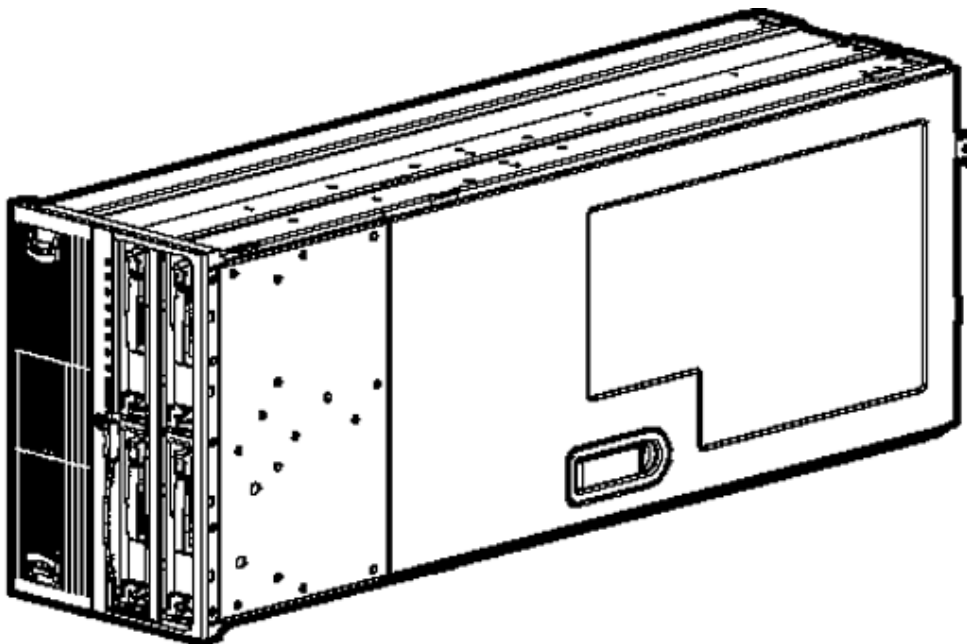
- Server blades and interconnects slide into p-Class server blade enclosures for network connection and power
- Server blade enclosure is 6U high and 10 bays across. The server blade enclosure bays consist of 2 (outer) interconnect bays and 8 server bays. One server blade enclosure can hold up to 2 ProLiant BL40p server blades and 2 interconnects
- 2 types of interconnects available:
 - interconnect switches or patch panels

ProLiant BL p-Class Power Enclosure:

- Use BL p-Class sizing tool to determine power based on your configuration
<http://h30099.www3.hp.com/configurator/powercalcs.asp>
- BL p-Class power enclosure provides shared, external, redundant power
- Power enclosure is 3U high and holds up to 6 hot-plug power supplies
- Available in single-phase or three-phase power configurations
- BL p-Class power enclosure with power supplies not needed if using facility DC ($-48\text{VDC} \pm 10\%$). In this case purchase DC option kit

ProLiant BL p-Class Power Distribution:

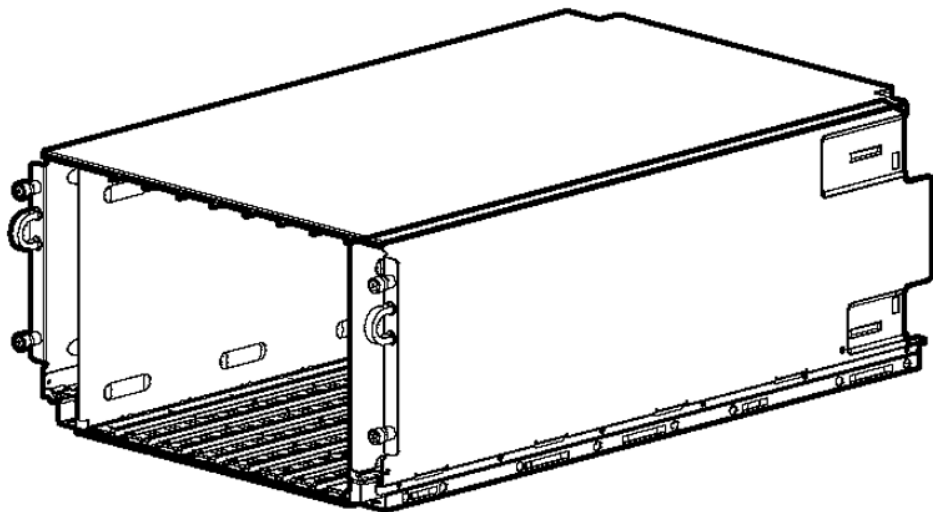
- Distributes power from the power enclosure to the server blade enclosures
- Three power distribution choices:
 - BL p-Class scalable bus bar
 - BL p-Class mini bus bar
 - BL p-Class power bus box
- **NOTE:** Power requirements for a ProLiant BL p-Class system: 200V - 240V AC, 30 amp or facility DC $-48\text{V} \pm 10\%$.
- BL p-Class server blade, server blade enclosure, interconnects and power enclosure protected by a limited three year warranty with optional service uplifts available



ProLiant BL40p Server Blade

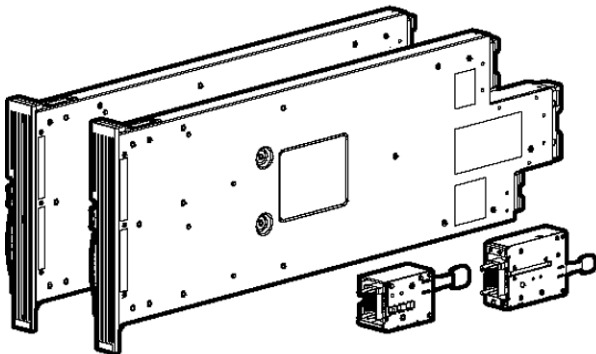
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Overview



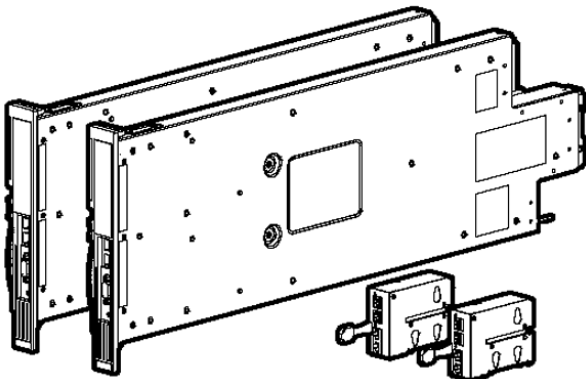
BL p-Class Server Blade Enclosure

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Patch Panel (shown) or Patch Panel 2

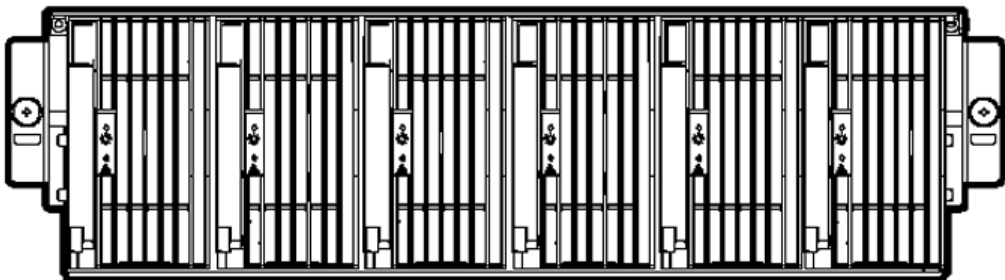
OR



GbE Interconnect Switch
or GbE2 Interconnect Switch (fiber or copper-based)

BL p-Class Interconnects

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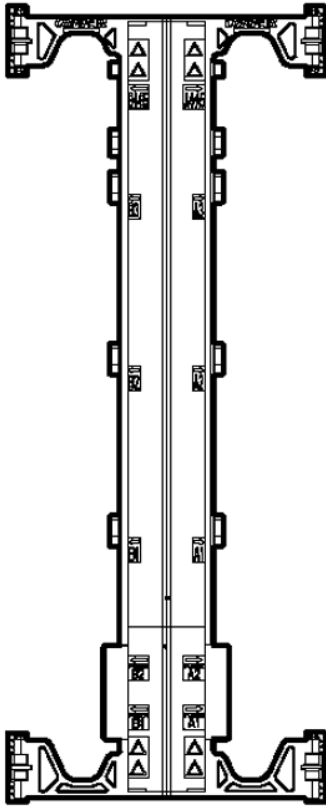


OR Facility DC

BL p-Class power enclosures and power supplies

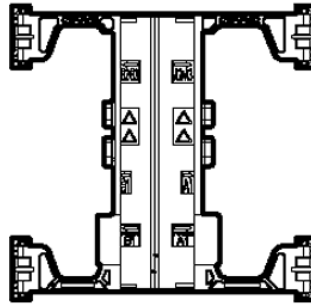
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Overview



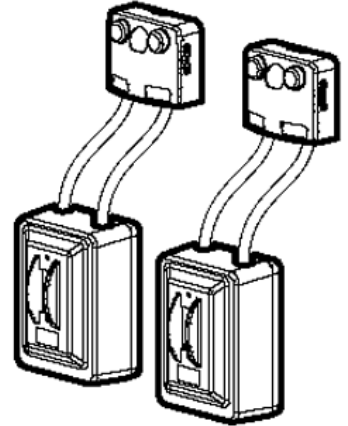
Scalable bus bar

OR



BL p-Class power distribution

OR



Bus boxes

Configuration Steps

For a complete configuration of the ProLiant BL40p, do the following:

1. Select a BL40p server blade:
Single Xeon MP 2.2GHz processor, 512-MB RAM (2 x 256MB) (345628-B21)
or
Single Xeon MP 3.0GHz processor, 1-GB RAM (2 X 512M) (344286-B21)
or
Two Xeon MP 2.0 GHz processors, 512-MB RAM (2 x 256MB) (293462-B21)
or
Two Xeon MP 2.8 GHz processors, 1-GB RAM (2 X 512MB) (336119-B21)
(NOTE: Additional options include processors, memory, and PCI-X HBAs.)

PLUS

2. Decide how many BL p-Class Server Blade Enclosures to purchase (each enclosure can hold up to 2 ProLiant BL40p server blades):

BL p-Class server blade enclosure with 8 Rapid Deployment Pack licenses (281404-B21)
or
BL p-Class server blade enclosure with Rapid Deployment Pack trial (243564-B21)

PLUS

Select an Interconnect Kit. Each Interconnect Kit contains a pair of interconnects. One pair of interconnects is required with each ProLiant BL p-Class server blade enclosure:

BL p-Class RJ-45 Patch Panel (with 32 RJ-45 connectors) (230766-B21)
or
RJ-45 Patch Panel 2 with Fibre Channel pass through (required for Fibre Channel connectivity on BL20p G2 when using the RJ-45 Patch Panel 2) (with 32 RJ-45 connectors and 16 Fibre Channel connectors) (306465-B21)
or
BL p-Class C-GbE2 Interconnect Kit (with 12 RJ-45 10/100/1000 T/TX/T external ports) (283192-B21) with or without optional ProLiant BL p-

Overview

Class GbE Storage Connectivity Kit (with 16 Fibre Channel connectors) (required for ProLiant BL20p G2 Fibre Channel connectivity when using the GbE2 Interconnect Switch)

or

BL p-Class F-GbE2 Interconnect Kit (with 8 LC 1000 SX and 4 RJ-45 10/100/1000 T/TX/T external ports) (283193-B21) with or without optional ProLiant BL p-Class GbE Storage Connectivity Kit (with 16 Fibre Channel connectors) (required for ProLiant BL20p G2 Fibre Channel connectivity when using the GbE2 Interconnect Switch)

or

BL p-Class C-GbE Interconnect Kit (with 4 RJ-45 10/100/1000 T/TX/T and 8 RJ-45 10/100 T/TX external ports) (249655-B21)

or

BL p-Class F-GbE Interconnect Kit (with 4 LC 1000 SX and 8 RJ-45 10/100 T/TX external ports) (279720-B21)

PLUS

4. Select BL p-Class power enclosure and power supplies based on configuration. Use p-Class sizing tool to help determine power configuration: <http://h30099.www3.hp.com/configurator/powercalcs.asp>

NOTE: Power enclosures and supplies are not needed if using facility DC (-48V ± 10%).

Single phase power enclosure with four hot-plug power supplies (NA/JPN- 239162-001) (Single-phase power enclosure holds a max of four power supplies; no need to order additional power supplies with this option kit) (INTL - 239162-421)

or

Three-phase power enclosure with six hot-plug power supplies (NA/JPN- 230769-001) (INTL - 230769-421) (Three-phase power enclosure holds a max of six power supplies no need to order additional power supplies with this option kit)

(Power enclosures and power supplies can also be purchased separately see options list for part numbers)

PLUS

5. Select power distribution:

Scalable bus bar - Supports up to 5 server blade enclosures (240560-B21)

or

Mini bus bar - Supports up to 3 server blade enclosures (240559-B21)

or

Power Bus Box - connects 1 power enclosure to 1 server blade enclosure (240562-B21)

**maximum depends on power input*

Standard Features (Server Blade)

ProLiant BL40p Server Blade

Processor	Xeon MP processor 3.0 GHz/4MB
<i>One of the following depending on Model:</i>	Xeon MP processor 2.2 GHz/2MB
	Xeon MP processor 2.8 GHz/2MB
	Xeon MP processor 2.0 GHz/1MB

Upgradeability	Upgradeable to quad processing
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Cache Memory	4-MB Level 3 Cache (on the 3.0GHz Model)
	2-MB Level 3 Cache (on the 2.8GHz and 2.2GHz Models)
	1-MB Level 3 Cache (on the 2.0GHz Model)

Chipset	ServerWorks GC-LE chipset
	NOTE: For more information regarding ServerWorks, please see the following URL: http://www.serverworks.com/products/overview.html .

Memory	Standard	512MB of 2-way interleaved PC2100 ECC DDR (2 X 256 MB) (1 processor model)
	Maximum	12,288 MB
	Standard	1024MB of 2-way interleaved PC2100 ECC DDR (2 X 512MB) (2 processor model)
	Maximum	12,288 MB
NOTE: Memory must be installed in pairs. Advanced Memory Protection with Online Spare.		

Network Controller	Six network adapters total:
	Five NC7781 PCI-X Gigabit NICs (embedded) with WOL and PXE
	One 10/100T iLO NIC dedicated to management

Manageability	Integrated Lights-Out (iLO) Management Advanced (ASIC on the System Board)
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Internal Storage	Hard Drives	None ship standard
	Maximum Internal Storage	587.2 GB (internal drive cage) (4 x 146.8 GB Ultra320, 1" drives) NOTE: All U320 Universal Hard Drives are backward compatible to U2 or U3 speeds.

Expansion Slots	Two Dedicated PCI-X slots (64b/100MHz capable) for redundant SAN connectivity
I/O cable	I/O cable connectors: (2)USB ports, (1) video port, (1) iLO port and (1) kernel debug port (1) cable ships with all 3.2GHz models Connects to the front of the server blade for aid in 1st server blade deployment and troubleshooting Tested USB devices (keyboard, mouse, floppy) are listed in options section of this QuickSpec
Diagnostic cable	Diagnostic Cable Connectors: (1) iLO port and (1) kernel debug port 2 Diagnostic cables ship with every server blade enclosure Connects to the front of the server blade for aid in troubleshooting

Standard Features (Server Blade)

Dimensions

6U high x 7" wide. Fits within p-Class Server Blade Enclosure. One BL40p takes up four (4) server blade bays within a server blade enclosure. Two BL40p server blades can fit within one server blade enclosure.

Standard Features (Server Blade Enclosure and Interconnects)

ProLiant BL p-Class Server Blade Enclosure and Interconnects

ProLiant BL p-Class Server Blade Enclosure	6U (10.5-inch), 19-inch wide Holds up to 2 ProLiant BL40p server blades; 8 ProLiant BL20p server blades; or a combination of both. 10 bays per server blade enclosure: 8 bays for server blades 2 outside bays for interconnect modules (RJ-45 Patch Panels, RJ-45 Patch Panel 2, GbE2 Interconnect Switches, or GbE Interconnect Switches) Server blades slide in and connect to the server blade enclosure back plane for power and data connections Up to 6 BL p-Class server blade enclosures fit in a 42U rack Server blade management module attached to the back of each BL p-Class server blade enclosure to report all server events and provide asset and inventory information
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ProLiant BL p-Class Power Requirements	Redundant 200V - 240V AC, 30 amp single-phase for NA and International Redundant 208V 30amp 3-phase 4 wire, NA Redundant 380 - 415V 20A 3-phase 5 wire, Intl Redundant -48VDC ± 10%
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Standard Features (Server Blade Enclosure and Interconnects)

ProLiant BL p-Class Interconnect Switch Option

(Two switches per kit)
(Every BL p-Class server blade enclosure requires two interconnect switches OR two RJ-45 patch panels)

Provides up to a 32 to 1 server networking cable reduction per server enclosure depending on the mix of BL20p, BL20p G2, and BL40p servers. Each interconnect switch (two per enclosure) reduces up to sixteen internal server network (NICs) ports to six external ports (four on a modular rear mounting interconnect module and two on the switch front panel). This provides a total of twelve external ports per server blade enclosure. Only one to all twelve external ports may be used per server blade enclosure.

The GbE2 Interconnect Kits (C-GbE2 and F-GbE2) are for applications that require network adapter consolidation to 1000 Mbps (Gigabit Ethernet), advanced network feature support including up to layer 7 switching, BL20p G2 Fibre Channel pass-through, and 10 Gigabit Ethernet bandwidth connectivity to the network. Expandability of both layer 3-7 switching and 10 Gigabit Ethernet is supported with future GbE2 Interconnect Switch upgrade options. The optional GbE2 Storage Connectivity Kit is required for BL20p G2 Fibre Channel pass-through when using the GbE2 Interconnect Switch.

- The ProLiant BL p-Class F-GbE2 Interconnect Kit includes two GbE2 Interconnect Switches and two QuadSX Interconnect Modules that provide eight (8) LC 1000 SX and four (4) RJ-45 10/100/1000 T/TX/T external ports per server blade enclosure.
- The ProLiant BL p-Class C-GbE2 Interconnect Kit includes two GbE2 Interconnect Switches and two QuadT2 Interconnect Modules that provide twelve (12) RJ-45 10/100/1000 T/TX/T external ports per server blade enclosure.

The GbE Interconnect Kits (C-GbE and F-GbE) are for applications that require network adapter consolidation to 100 Mbps (Fast Ethernet).

- The ProLiant BL p-Class F-GbE Interconnect Kit includes two GbE Interconnect Switches and two DualTSX Interconnect Modules that provide four (4) LC 1000 SX and eight (8) RJ-45 10/100 T/TX external ports per server blade enclosure.
- The ProLiant BL p-Class C-GbE Interconnect Kit includes two GbE Interconnect Switches and two QuadT Interconnect Modules that provide four (4) RJ-45 10/100/1000 T/TX/T and eight (8) RJ-45 10/100 T/TX external ports per server blade enclosure.

Also included (per Interconnect Switch):

- One (1) RS-232 DB-9 front panel out-of-band management port
- Redundant crosslink ports connecting the two interconnect switches
- Redundant power inputs and on-board redundant fans
- Hot-plug and hot-remove with configuration retention and no need to cable/re-cable
- Power ON, management, and per port status and speed LED indicators
- Reset/power momentary push-button switch
- HP ProLiant BL Interconnect Switch Management Utilities and User Documentation CD
- Fully pre-configured for rapid deployment and immediate operation

ProLiant BL Interconnect Switch Management System and Utilities:

Full featured web-based and scriptable command line (CLI) interfaces, password protected multi-level user accounts, Telnet, SNMP, BootP client, port mirroring, port-based VLANs and VLAN tagging, EtherChannel compatible multi-port trunking, network time protocol, spanning tree protocol, broadcast/multicast storm control, flow control, human readable/writeable configuration file, TFTP client, IP address security restrictions, auto-MDI/MDIX, auto-negotiation and auto-sensing with full-duplex support, and more.

ProLiant BL p-Class RJ-45 patch panel

(Two patch panels per kit)
(Every BL p-Class server blade enclosure requires two interconnect switches OR two RJ-45 patch panels)

6U (10.5-inch), Plugs into BL p-Class 6U server blade enclosures

Used to pass NIC signals from all server blades in server blade enclosure out as RJ-45 connections

Supports Gigabit Ethernet network controllers. 16 RJ-45 connectors on the back of each BL p-Class 6U RJ-45 patch panel (32 RJ-45 connections per server blade enclosure).

Standard Features (Server Blade Enclosure and Interconnects)

Required Network Cabling	10Base-T	Categories 3, 4 or 5 UTP (100 meters) EIA/TIA-568 100-ohm STP (100 meters)
	100Base-TX	Category 5 UTP (100 meters) EIA/TIA-568 100-ohm STP (100 meters)
	1000Base-T	Category 5 UTP (100 meters) EIA/TIA-568 100-ohm STP (100 meters)
	1000Base-SX	50/125 μm Multimode Fiber, 400 MHz/Km (500 meters) 50/125 μm Multimode Fiber, 500 MHz/Km (550 meters) 62.5/125 μm Multimode Fiber, 160 MHz/Km (220 meters) 62.5/125 μm Multimode Fiber, 200 MHz/Km (275 meters)

Standard Features (Power System and Rack Information)

ProLiant BL p-Class
Power System and Rack
information

NOTE: To determine power configuration please refer to the ProLiant BL p-Class Overview and Planning Whitepaper and sizing tool, please see the following URL:
<http://h18000.www1.hp.com/products/servers/proliant-bl/p-class/20p/index.html>

ProLiant BL p-Class
Power Enclosure

3U (5.25-inch), 19-inch wide, 29-inch deep (0.48-meter wide, 0.74-meter deep), Dual input single phase and three phase models available. BL p-Class power enclosure provides external, shared hot-plug power. Each three-phase power enclosure houses up to six hot-plug power supplies each single-phase power enclosures hold up to four hot-plug power supplies to power the BL p-Class server blades and interconnects. Please use the sizing utility to determine the power needed for each configuration.
<http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls>
Power enclosures and power supplies are not needed if using facility DC (-48V DC ± 10%). If using facility DC, only Facility DC Power Connection kit part number (240563-B21) is needed.

BL p-Class Power
Distribution

In the ProLiant BL p-Class infrastructure, redundant -48 VDC power (from the power enclosures or facility DC power) is distributed from the power enclosures to the server blade enclosures through a bus bar system. Hinges attach the ProLiant BL bus bars to the rails in a rack. The bus bars swing open from the center to enable easy rear access to the server blades and network cables. Power is distributed redundantly through independent A- and B-sided bus bars.
Three different power distribution solutions are available depending on the maximum number of server blade enclosures planned for the rack:

- ProLiant BL p-Class scalable bus bar
- ProLiant BL p-Class mini bus bar

NOTE: To support a full 42U rack server blades (6 server blade enclosures), two mini bus bars are needed.

- ProLiant BL p-Class power bus box

	Power Enclosures Supported	Server Blade Enclosures Supported	Max. Rack Space Occupied
Scalable Bus Bar	1 or 2	up to 5	36U
Mini Bus Bar	1	up to 3	21U
Power Bus Box	1	1	9U

Required Power Source

Two 30-amp redundant power feeds per power enclosure

Connectors

NEMA receptacles (NA/Japan)

NA 1-phase	L6-30, 250v, 30A 3-wire
NA 3-phase	L15-30, 250V, 30A, 4-wire

IEC 309 Pin & Sleeve connectors (International)

Intl 1-phase	250V, 32A, 3- pin (2 pole + ground)
Intl 3-phase	380-415V, 32A, 5--pin (4 pole + ground)

Optimized for power cabling from bottom and network cabling from top

Standard Features

ProLiant Essentials Foundation Pack Software for the ProLiant BL Server

ProLiant Essentials Rapid Deployment Pack	Rapid Deployment Pack (RDP) is an automated deployment and provisioning solution for all ProLiant servers. RDP includes the Altiris Deployment Solution and ProLiant Integration Module featuring ProLiant server pre-configured events for OS installation, and optimized software drivers, firmware and management agents. Every RDP CD includes 10-node trial licenses for evaluation purposes. RDP requires a license for each server deployed and are available for purchase with blade servers. For more information, visit http://www.hp.com/servers/rdp .
HP Systems Insight Manager	HP Systems Insight Manager (HP SIM) help maximize system uptime and performance and reduce system maintenance costs by providing proactive notification of problems before those problems result in unplanned downtime or reduced productivity. HP SIM is easy to set up to work with the Insight Management Agents, integrated Light-Out and Remote Insight Light-Out Edition, and Version Control Agents to deliver robust fault, configuration, and asset management as well as remote administration. With HP Systems Insight Manager customers will also be able to take advantage of role-based security; the ability to manage ProLiant, Integrity, and HP9000 systems; and plug-ins for storage, client, printer, and power management as well as server rapid deployment, performance management, and workload management. For more details on HP Systems Insight Manager visit http://www.hp.com/go/hpsim .
Management Agents	The Management Agents form the foundation for HP's Intelligent Manageability strategy. They provide direct, browser-based access to in-depth instrumentation built into HP servers, workstations, desktops, and portables, and send alerts to HP Systems Insight Manager and other enterprise management applications in case of subsystem or environmental failures. For additional information about the Management Agents and other management products from HP, please visit the management Web site at http://www.hp.com/servers/manage .
Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
ROMPaq, support software, and configuration utilities	The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options, available in the RDP CD, SmartStart or downloadable from Software and Drivers download pages, linked from the SmartStart website at http://www.hp.com/servers/smartstart .
Survey Utility and diagnostics utilities	The most advanced configuration analysis, reporting and troubleshooting utilities used by HP and at your fingertips, available in SmartStart.

NOTE: For more information regarding ProLiant Essentials Software, please see the following URL: <http://www.hp.com/servers/proliantessentials>

Optional ProLiant Essentials Value Packs

Optional software offerings that selectively extend the functionality of an Adaptive Infrastructure to address specific business problems and needs:

- Workload Management Pack - provides easier management of complex environments, improving overall server utilization and enabling Windows® 2000 customers for the first time to confidently deploy multiple applications on a single multiprocessor ProLiant Server.
- Performance Management Pack - a performance management solution that identifies and explains hardware performance bottlenecks on ProLiant servers and attached options enabling users to better utilize their valuable resources.
- Intelligent Networking Pack - detects and analyzes network bottlenecks or broken network linkages and steers traffic to the optimum route based on network conditions.

NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to <http://www.hp.com/servers/proliantessentials> or the various ProLiant Essentials Value Pack product QuickSpecs for more information.

Standard Features

SmartStart

SmartStart is a tool that simplifies single server setup, providing a rapid way to deploy reliable and consistent server configurations. SmartStart 7.00 and later can now deploy the ProLiant BL20P G3 and ProLiant BL40P servers, using the I/O port with an attached USB CD-ROM device. To obtain a copy of SmartStart for your blade server, redeem the coupon that is included with your Blade server or order your copy from the SmartStart web site. For more information, please visit the SmartStart Web site at <http://www.hp.com/servers/smartstart>. SmartStart version supported (minimum): SmartStart 6.20

OS Support

Microsoft® Windows 2000 Advanced Server
Red Hat Linux 8.0
Red Hat Enterprise Linux AS
SuSE Linux Enterprise Server 7
United Linux
Microsoft Windows Server 2003

NOTE: For a complete and up-to-date listing of supported OSs and versions, please visit our OS Support Matrix at: <http://www.hp.com/go/supportos>.

NOTE: For an up-to-date listing of the latest drivers available for the HP ProLiant BL p-Class, please see: <http://h18004.www1.hp.com/support/files/server/us/family/model/5342.html>.

NOTE: For a more complete and up-to-date information on Linux support, please visit HP Linux Web site at: <http://h18000.www1.hp.com/products/servers/linux/hpLinuxcert.html>.

Intelligent Manageability

Integrated Lights-Out Advanced (iLO)

Virtual CD-ROM
Virtual Floppy *
Virtual Power Button Control
Dedicated LAN Connectivity
Automatic IP Configuration via DHCP/DNS/WINS
Industry Standard 128-bit Secure Sockets Layer (SSL) Security
IML and iLO Event Logging
Support for 12 user accounts with customizable access privileges

Automatic Server Recovery-2 (ASR-2)
Insight Manager 7
HP Systems Insight Manager
Redundant ROM
Remote Flash ROM
ROM Based Setup Utility (RBSU)
Advanced Configuration and Power Interface Specification Ready (ACPI)
Server Health Logs
HP Redundant Power Supply Utility
Pre-Failure Warranty (covers processors, as well as hard drives and memory)
HP Interconnect Switch Management System and Utilities (interconnect switch option)
Integrated Management Log (IML)
Off-Line Backup Processor capability
Dynamic sector repairing and drive parameter tracking (with Smart Array controllers) Redundant/adaptive load balancing NIC Support
* Advanced features such as Graphical Remote Console and Virtual Floppy are included with the BL p-Class server.

Standard Features

Availability

Power redundancy: Redundant AC feeds into power enclosures; redundant DC feeds from power enclosure to server blade enclosures, 1 + 1 redundant power supplies
Four hot-plug SCSI hard drive bays and integrated RAID (Smart Array 5i Plus Controller with 64-MB total Memory on the 5i Plus Memory Module) on every server blade. Battery Backed Write Cache Enabler Module standard on the 2 processor model and optional on the 1 processor model. Redundant ROM on each server blade
ECC Memory
Interconnects Switch Availability

- Hot-plug and hot- remove with configuration retention and no need to cable/re-cable
- Two network connections per server blade bay (four NICs total) routed to two redundant interconnect switches
- Redundant inter-switch communication with two sets of redundant uplink ports per each interconnect switch
- Redundant front panel ports per each interconnect switch for diagnostics, management, and additional uplinks
- Redundant serial ports
- Compatibility with PVST+ (GbE2 switch) and 802.1D Spanning tree protocol support for loop-free path redundancy
- Static IEEE 802.3ad (EtherChannel compatible) trunking with automatic port load balancing and failover
- Redundant switch configuration images in memory (GbE2 switch)
- Redundant fans per each interconnect switch
- Redundant 1+1 power to each interconnect switch
- Support for ProLiant network adapter teaming
- Redundant configurable community strings and SNMP trap manager hosts
- Redundant configurable syslog server, DNS server, and default gateways (GbE2 switch)

Security

Power-on password
Administrator's password
Integrated Lights-Out has 12 customizable user accounts and SSL encryption
Integrated Lights-Out can be disabled via a Global Setting
Interconnect switch multilevel user names and passwords, management interface time out period setting, SSH*, SCP secure copy protocol*, port-based IEEE 802.1Q tagged VLANs, RADIUS user authentication and authorization*, and IP address restriction
[* GbE2 Interconnect Switch only.](#)

Minimum Rack Requirements

Mounts in HP Telco racks and Third Party racks that meet the following criteria:

- Compatible with 19-inch Standard EIA rail sets
- EIA rail-to-rail depth is 29 - 30"
- Cabinet depth must be at least 36-inch deep overall (Additional min. 3.5-inch clearance from rear RETMA rail to rear door, inclusive in the 36-inch overall depth)
- Ample room for top and bottom cable egress (approximately 8 square inches for full rack configuration with patch panel)
- Must be capable of supporting 1600 lb (for full rack configuration)
- Perforated front and rear doors to accommodate front-to-back cooling
- Must have 65% open perforation on server blade enclosure doors to support airflow requirements
- Optimized for use with the 10000 Series racks

NOTE: If using 7000 Series rack, Rack Extension Kit and High Air Flow Rack Door options are required.

Standard Features

Rack Airflow Requirements

- Rack 10000 series Cabinets
The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
- Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm).

CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

NOTE: For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server, or to the server documentation located in the Support section at the following URL:

<http://h18000.www1.hp.com/products/servers/proliant-bl/p-class/40p/documentation.html>.

Service and Support

Three-year limited warranty, including hardware diagnostic support, pre-failure warranty (coverage of hard drives, memory and processors). The warranty is fully supported by HP Services and a worldwide network of resellers and service providers. In addition 90-day's getting started software telephone support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services.

NOTE: Server Blade Limited Warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.

NOTE: Server Blade Enclosure and Interconnects Limited Warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.

Care Pack services provide a range of life cycle support options that let you choose the service levels that meet your business requirements, from basic to mission-critical.

A full range of HP Care Pack hardware and software services are available including:

- Installation and start up
- Education courses
- Extended onsite hardware coverage hours from same business day 13 hours, 5 day to 24 hours, 7 days call window with options including 4-hour response or 6-hour Call To Repair
- Comprehensive range of software technical support for Microsoft, Linux, ProLiant Essentials and VMWare-based IT solutions helping to deliver high level of application availability. Response times range from 30 mins for critical problems to 2 hours.
- System Management, Performance Services and Mission Critical Support Solution

HP Care Pack services for ProLiant BL p-Class server blades, cover the server blade and the p-Class blade enclosure that the server blade is installed in as well as interconnects, power enclosure with power supplies and power distribution.

NOTE: For more information on HP Care Pack services, contact any of our worldwide sales offices or resellers or visit our worldwide Web site on the internet at: <http://www.hp.com/hps/carepack>

NOTE: For more complete information on HP Services offerings, customers and resellers, please visit us at: <http://www.hp.com/hps>

NOTE: Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

Models

ProLiant BL40p P3.0-4MB, 1GB (2P) 344286-B21	Processor(s)	(2) Xeon MP 3.0 GHz standard (up to 4 supported)
	Cache Memory	4-MB Level 3 Cache (per processor)
	Memory	1024 MB (Standard) of 2-way interleaved PC2100 ECC DDR (2 X 512 MB)
	Network Controller	Five NC7781 PCI-X Gigabit NICs (embedded) with WOL and PXE One additional 10/100T NIC dedicated to iLO Management
	Storage Controller	Smart Array 5i Plus Controller (integrated on system board) with BBWC
	Hard Drives	None ship standard
	Internal Storage	Up to 587.2 GB maximum
	Optical Drive	None
	I/O cable	Included
	Form Factor	6U high x 7" wide. Fits within p-Class Server Blade Enclosure

ProLiant BL40p P2.2-2MB, 512MB (1P) 345628-B21	Processor(s)	(1) Xeon MP 2.2 GHz standard (up to 4 supported)
	Cache Memory	2-MB Level 3 Cache (per processor)
	Memory	512 MB (Standard) of 2-way interleaved PC2100 ECC DDR (2 X 256 MB)
	Network Controller	Five NC7781 PCI-X Gigabit NICs (embedded) with WOL and PXE One additional 10/100T NIC dedicated to iLO Management
	Storage Controller	Smart Array 5i Plus Controller (integrated on system board)
	Hard Drives	None ship standard
	Internal Storage	Up to 587.2 GB maximum
	Optical Drive	None
	I/O cable	Included
	Form Factor	6U high x 7" wide. Fits within p-Class Server Blade Enclosure

ProLiant BL40p P2.8-2MB, 1GB (2P) 336119-B21	Processor(s)	(2) Xeon MP 2.8 GHz standard (up to 4 supported)
	Cache Memory	2-MB Level 3 Cache (per processor)
	Memory	1024 MB (Standard) of 2-way interleaved PC2100 ECC DDR (2 X 512 MB)
	Network Controller	Five NC7781 PCI-X Gigabit NICs (embedded) with WOL and PXE One additional 10/100T NIC dedicated to iLO Management
	Storage Controller	Smart Array 5i Plus Controller (integrated on system board) with BBWC
	Hard Drives	None ship standard
	Internal Storage	Up to 587.2 GB maximum
	Optical Drive	None
	Form Factor	6U high x 7" wide. Fits within p-Class Server Blade Enclosure

ProLiant BL40p P2.0-1MB, 512MB (1P) 336118-B21	Processor(s)	(1) Xeon MP 2.0 GHz standard (up to 4 supported)
	Cache Memory	1-MB Level 3 Cache (per processor)
	Memory	512 MB (Standard) of 2-way interleaved PC2100 ECC DDR (2 X 256 MB)
	Network Controller	Five NC7781 PCI-X Gigabit NICs (embedded) with WOL and PXE One additional 10/100T NIC dedicated to iLO Management
	Storage Controller	Smart Array 5i Plus Controller (integrated on system board)
	Hard Drives	None ship standard
	Internal Storage	Up to 587.2 GB maximum
	Optical Drive	None
	Form Factor	6U high x 7" wide. Fits within p-Class Server Blade Enclosure

Options

ProLiant BL40p Unique Options	Xeon MP 3.0GHz 4MB Processor Option Kit	344287-B21
	Xeon MP 2.2GHz 2MB Processor Option Kit	345627-B21
	Xeon MP 2.8GHz 2MB Processor Option Kit	336121-B21
	Xeon MP 2.0GHz 1MB Processor Option Kit	336120-B21
	Xeon MP 1.5GHz 1MB Processor Option Kit	309330-B21
	Xeon MP 2.0GHz 2MB Processor Option Kit	309331-B21
	ProLiant p-Class Diagnostic Station Upgrade Kit for the BL40p	309329-B21
ProLiant Essentials Value Pack Software	Rapid Deployment Pack, 10 User, V1.x NOTE: This license allows 10 servers to be managed and deployed via the Deployment Server. NOTE: Not necessary if you purchase the server blade enclosure with 8 Rapid Deployment Pack licenses 281404-B21. NOTE: Rapid Deployment pack is now available in Linux only environments.	269817-B21
	Rapid Deployment Pack, 10 User, V1.x (Japan) NOTE: This license allows 10 servers to be managed and deployed via the Deployment Server. NOTE: Not necessary if you purchase the server blade enclosure with 8 Rapid Deployment Pack licenses 281404-B21. NOTE: Rapid Deployment pack is now available in Linux only environments.	269817-291
	Rapid Deployment Pack, 1 User, V1.x NOTE: This license allows 1 server to be managed and deployed via the Deployment Server. NOTE: Not necessary if you purchase the server blade enclosure with 8 Rapid Deployment Pack licenses 281404-B21. NOTE: Rapid Deployment pack is now available in Linux only environments.	267196-B21
	Rapid Deployment Pack, 1 User, V1.x (Japan) NOTE: This license allows 1 server to be managed and deployed via the Deployment Server. NOTE: Not necessary if you purchase the server blade enclosure with 8 Rapid Deployment Pack licenses 281404-B21. NOTE: Rapid Deployment pack is now available in Linux only environments.	267196-291
	ProLiant Essentials Intelligent Networking Pack, Single Server License NOTE: For use with a single server. Contains one license with a unique license activation key and documentation.	372906-B21
	ProLiant Essentials Intelligent Networking Pack, Flexible License NOTE: For use with multiple servers. This part number can be used to purchase multiple licenses with a single activation key. The quantity ordered for this part number will be the quantity of licenses included in the kit in the form of a corresponding activation key. Use the same key to activate all licenses in the actual quantity ordered. For a given order, one kit will be delivered with the activation key, and documentation.	372950-B21
	ProLiant Essentials Intelligent Networking Pack, Tracking License NOTE: For use with signed and implemented Activation Key Agreements only. Purchase of this part number entitles the customer to deploy additional licenses of the product under the terms of the existing Activation Key Agreement. NOTE: Nothing is delivered in conjunction with the purchase of this part number. Visit http://h18004.www1.hp.com/products/servers/proliantessentials/license/akalic.html for more information on Activation Key Agreements.	372951-B21
	ProLiant Essentials Performance Management Pack, 10-Server License NOTE: For use with 10 servers. Contains 10 licenses with one unique license activation key and documentation.	374055-B21
	ProLiant Essentials Performance Management Pack, Single-Server License NOTE: For use with a single server. Contains one license with a unique license activation key and documentation.	306696-B21
	ProLiant Essentials Performance Management Pack, Flexible-Quantity License NOTE: For use with multiple servers. This part number can be used to purchase multiple licenses with a single activation key. The quantity ordered of this part number will be the quantity of licenses included in the kit in the form of a corresponding activation key. Use the same key to activate all licenses in the actual quantity ordered. For a given order, one kit will be delivered with the activation key, and documentation.	306697-B21

Options

ProLiant Essentials Workload Management Pack (Featuring Resource Partitioning Manager version 2.0)	303284-B21
Flexible Quantity License Kit	302127-B21
License-Only - for use with a Master License Agreement	302128-B21

NOTE: For more information regarding ProLiant Essentials Software, please see the following URL: <http://h18000.www1.hp.com/products/servers/proliantessentials/index.html>.

NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to URL <http://h18000.www1.hp.com/products/servers/proliantessentials/index.html> or the various ProLiant Essentials Value Pack product QuickSpecs for more information.

Processor	Xeon MP 3.0GHz 4MB Processor Option Kit	344287-B21
	Xeon MP 2.2GHz 2MB Processor Option Kit	345627-B21
	Xeon MP 2.8GHz 2M Processor Option Kit	336121-B21
	Xeon MP 2.0GHz 1M Processor Option Kit	336120-B21
	Xeon MP 1.5GHz 1M Processor Option Kit	309330-B21
	Xeon MP 2.0GHz 2M Processor Option Kit	309331-B21

Memory (DDR DIMMs)	512MB of PC2100 ECC DDR DIMM Memory Kit (2x256MB)	300678-B21
	1024MB of PC2100 ECC DDR DIMM Memory Kit (2x512MB)	300679-B21
	2048MB of PC2100 ECC DDR DIMM Memory Kit (2x1024MB)	300680-B21
	4096MB of PC2100 ECC DDR DIMM Memory Kit (2x2048MB)	300682-B21

Hard Drives	Wide Ultra320 – Universal Hot Plug	
	146.8-GB 10,000 rpm U320 Universal Hard Drive (1")	286716-B22
	72.8-GB 10,000 rpm U320 Universal Hard Drive (1")	286714-B22
	300-GB 10,000 rpm U320 Universal Hard Drive (1")	350964-B21
	72.8-GB 15,000 rpm U320 Universal Hard Drive (1")	286778-B22
	36.4-GB 15,000 rpm U320 Universal Hard Drive (1")	286776-B22
NOTE: All U320 Universal Hard Drives are backward compatible to U2 or U3 speeds.		
NOTE: Please see the Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature:		
U320 Hard Drive QS:		
http://h18000.www1.hp.com/products/quickspecs/11531_div/11531_div.HTML (Worldwide)		
http://h18000.www1.hp.com/products/quickspecs/11531_na/11531_na.HTML (North America)		

Storage Controllers	Battery Backed Write Cache Enabler Option Kit	255514-B21
	Battery Backed Write Cache Enabler Option Kit (Japan)	255514-291

Tape Libraries	HP StorageWorks MSL6000 Tape Library	
	MSL6030, 1 drive, 30 slots, Ultrium 460, RM	330731-B22
	MSL6030, 2 drive, 30 slots, Ultrium 460, RM	330731-B23
	MSL6030, 1 drive, 30 slots, Ultrium 460, RM with embedded FC router	330731-B24
	MSL6030, 2 drive, 30 slots, Ultrium 460, RM with embedded FC router	330731-B25
	MSL6030, 1 drive, 30 slots, Ultrium 460, TT	330788-B21
	MSL6030, 2 drive, 30 slots, Ultrium 460, TT	330788-B22

Options

MSL6060, 2 drive, 60 slot, Ultrium 460, RM	331196-B21
MSL6060, 2 drive, 60 slot, Ultrium 460, RM with embedded FC router	331196-B22
MSL6060, 2 drive, 60 slot, Ultrium 460, TT	331195-B21

NOTE: Please reference the MSL6000 Tape Library QuickSpecs at <http://www.hp.com/go/automation> for additional information needed to create a complete solution; reference current compatibility information at <http://www.hp.com/go/ebs>

HP StorageWorks MSL5026S2 Tape Library

MSL5026S2, 1 drive, 26 slots, SDLT 320, RM	293472-B22
MSL5026S2, 2 drive, 26 slots, SDLT 320, RM	293472-B23
MSL5026S2, 1 drive, 26 slots, SDLT 320, RM with embedded FC router	293472-B24
MSL5026S2, 2 drive, 26 slots, SDLT 320, RM with embedded FC router	293472-B25
MSL5026S2, 1 drive, 26 slots, SDLT 320, TT	293473-B21
MSL5026S2, 2 drive, 26 slots, SDLT 320, TT	293473-B22

NOTE: Please reference the MSL5026S2 Tape Library QuickSpecs at <http://www.hp.com/go/automation> for additional information needed to create a complete solution; reference current compatibility information at <http://www.hp.com/go/ebs>

HP StorageWorks MSL5052S2 Tape Library

MSL5052S2, 2 drive, 52 slots, SDLT 320, RM	293474-B21
MSL5052S2, 2 drive, 52 slots, SDLT 320, RM with embedded FC router	293474-B24
MSL5052S2, 2 drive, 52 slots, SDLT 320, TT	293476-B21

NOTE: Please reference the MSL5052S2 Tape Library QuickSpecs at <http://www.hp.com/go/automation> for additional information needed to create a complete solution; reference current compatibility information at <http://www.hp.com/go/ebs>

HP StorageWorks MSL5030 Tape Library

MSL5030, 1 drive, 30 slots, Ultrium 230, RM	301897-B22
MSL5030, 2 drive, 30 slots, Ultrium 230, RM	301897-B23
MSL5030, 1 drive, 30 slots, Ultrium 230, RM with embedded FC router	301897-B24
MSL5030, 2 drive, 30 slots, Ultrium 230, RM with embedded FC router	301897-B25
MSL5030, 1 drive, 30 slots, Ultrium 230, TT	301898-B21
MSL5030, 2 drive, 30 slots, Ultrium 230, TT	301898-B22

NOTE: Please reference the MSL5030 Tape Library QuickSpecs at <http://www.hp.com/go/automation> for additional information needed to create a complete solution; reference current compatibility information at <http://www.hp.com/go/ebs>

HP StorageWorks MSL5060 Tape Library

MSL5060, 2 drive, 60 slots, Ultrium 230, RM	301899-B22
MSL5060, 2 drive, 60 slots, Ultrium 230, RM with embedded FC router	301899-B23
MSL5060, 2 drive, 60 slots, Ultrium 230, RM with embedded FC router	301900-B21
MSL5060, 2 drive, 60 slots, Ultrium 230, TT	

NOTE: Please reference the MSL5060 Tape Library QuickSpecs at <http://www.hp.com/go/automation> for additional information needed to create a complete solution; reference current compatibility information at <http://www.hp.com/go/ebs>

HP StorageWorks ESL9000 Series Tape Libraries

Options

ESL9595 Extended Tape Library, 0 drive, 400 slots (card cage, Interface Mgr card, Command View license)	343378-B21
ESL9595 Library, 0 drive, 400 slots	330833-B21
ESL9322 Extended Tape Library, 0 drive, 222 slots (card cage, Interface Mgr card, Command View license)	343377-B21
ESL9595 Library, 0 drive, 222 slots	330832-B21
ESL9000 Ultrium 460 drive kit	330834-B21
ESL9000 Ultrium 230 drive kit	301930-B21
ESL9000 SDLT 320 drive kit	293414-B21
ESL9000 400 to 500 slot upgrade	330842-B21
ESL9000 500 to 595 slot upgrade	330842-B22
ESL9000 400 to 595 slot upgrade	330842-B23
ESL9000 222 to 322 slot upgrade	330840-B21
ESL9000 E2400-160 FC Interface Controller (one controller for every four drives)	330839-B21
License for Direct Backup Engine ESL	343375-B21
License for Secure Manager ESL	343376-B21

NOTE: Please reference the ESL9000 Series Tape Libraries QuickSpecs at <http://www.hp.com/go/automation> for additional information needed to create a complete solution; reference current compatibility information at <http://www.hp.com/go/ebs>

Magneto-Optical Jukeboxes

HP StorageWorks 9.1 GB Mid-range Optical Jukeboxes

300mx, 2 drive, 32 slot jukebox	C1150M
600mx, 4 drive, 64 slot jukebox	C1160M
700mx, 2 drive, 76 slot jukebox	C1170M

NOTE: Please reference the Magneto-Optical Jukebox data sheets at <http://www.hp.com/go/optical> for additional information needed to create a complete solution

HP StorageWorks 9.1 GB High-end Optical Jukeboxes

1200mx, 4 drive, up to 128 slots	C1104M
1200mx, 6 drive, up to 128 slots	C1105M
2200mx, 4 drive, up to 238 slots	C1111M
2200mx, 6 drive, up to 238 slots	C1107M
2200mx, 10 drive, up to 238 slots	C1110M

BL p-Class Server Blade Enclosures

ProLiant BL p-Class Server Blade Enclosure (ProLiant Essentials Rapid Deployment Pack Trial)	243564-B21
ProLiant BL p-Class Server Blade Enclosure (8 ProLiant Essentials Rapid Deployment Pack Licenses)	281404-B21

Options

BL p-Class Interconnects	ProLiant BL p-Class RJ-45 Patch Panel 2 with Fibre Channel pass-through (pair) (required for ProLiant BL20p G2 Fibre Channel connectivity when using the RJ-45 Patch Panel 2) NOTE: Only one interconnect kit required per server blade enclosure.	306465-B21
	ProLiant BL p-Class RJ-45 Patch Panel (pair) NOTE: Only one interconnect kit required per server blade enclosure.	230766-B21
	ProLiant BL p-Class C-GbE2 Interconnect Kit (with pair of GbE2 Interconnect Switches and two QuadT2 Interconnect Modules) NOTE: Only one interconnect kit required per server blade enclosure.	283192-B21
	ProLiant BL p-Class F-GbE2 Interconnect Kit (with pair of GbE2 Interconnect Switches and two QuadSX Interconnect Modules) NOTE: Only one interconnect kit required per server blade enclosure.	283193-B21
	ProLiant BL p-Class C-GbE Interconnect Kit (with pair of GbE Interconnect Switches and two QuadT Interconnect Modules) NOTE: Only one interconnect kit required per server blade enclosure. NOTE: The GbE Interconnect Switch supports server NIC speeds to 100 Mbps. It is recommended that the GbE2 Interconnect Switch or a patch panel option be used if server NIC speeds to 1000 Mbps are required. NOTE: To meet applicable radio frequency (RF) emission limits, the sidewall panels on the ends of any individual rack or a series of coupled racks and the front and rear doors must be installed in any racks containing more than one ProLiant BL p-Class GbE Interconnect Kit.	249655-B21
	ProLiant BL p-Class F-GbE Interconnect Kit (with pair of GbE Interconnect Switches and two DualTSX Interconnect Modules) NOTE: Only one interconnect kit required per server blade enclosure. NOTE: The GbE Interconnect Switch supports server NIC speeds to 100 Mbps. It is recommended that the GbE2 Interconnect Switch or a patch panel option be used if server NIC speeds to 1000 Mbps are required. NOTE: To meet applicable radio frequency (RF) emission limits, the sidewall panels on the ends of any individual rack or a series of coupled racks and the front and rear doors must be installed in any racks containing more than one ProLiant BL p-Class GbE Interconnect Kit.	279720-B21
	ProLiant BL p-Class GbE2 Storage Connectivity Kit (with two Fibre Channel signal conditioning cards and two OctalFC Interconnect Modules) (required for ProLiant BL20p G2 Fibre Channel connectivity when using the GbE2 Interconnect Switch)	321745-B21

Options

BL p-Class Power options **NOTE:** Use p-Class sizing tool to help determine power configuration:

<http://www.hp.com/products/configurator>.

Single Phase Redundant Power Enclosure with 4 power supplies (NA/JPN) (Single Phase Power Enclosure holds a maximum of 4 power supplies; no need to order additional power supplies with this option kit)	239162-001
Single Phase Redundant Power Enclosure with 4 power supplies (Int'l) (Single Phase Power Enclosure holds a maximum of 4 power supplies; no need to order additional power supplies with this option kit)	239162-421
3 Phase Redundant Power Enclosure with 6 power supplies (NA/JPN) (3 Phase Power Enclosure holds a maximum of 4 power supplies; no need to order additional power supplies with this option kit)	230769-001
3 Phase Redundant Power Enclosure with 6 power supplies (Int'l) (3 Phase Power Enclosure holds a maximum of 4 power supplies; no need to order additional power supplies with this option kit)	230769-421
Single Phase Power Enclosure (empty) (NA/JPN) (Holds up to 4 power supplies; power supplies are not included in this kit)	231710-001
Single Phase Power Enclosure (empty) (Int'l) (Holds up to 4 power supplies; power supplies are not included in this kit)	231710-421
3 Phase Power Enclosure (empty) (NA/JPN) (Holds up to 6 power supplies; power supplies are not included in this kit)	231709-001
3 Phase Power Enclosure (empty) (Int'l) (Holds up to 6 power supplies; power supplies are not included in this kit)	231709-421
Single Power Supply	239161-B21
Facility DC Power Connection	240563-B21

Power Distribution	ProLiant p-Class Scalable Bus Bar	240560-B21
	ProLiant p-Class Mini Bus Bar	240559-B21
	ProLiant p-Class Bus Power Box	240562-B21

Diagnostic Options	ProLiant p-Class Diagnostic Station	230743-B21
	NOTE: The Diagnostic Station allows access to the ProLiant p-Class server blades and the BL p-Class interconnect switches outside of the server enclosure. The option provides power and a data interface so that "offline" upgrade and diagnostic functions may be performed.	
	ProLiant p-Class Diagnostic Station Upgrade Kit for the BL40p	309329-B21

Other Options	ProLiant BL p-Class Server Enclosure Shipping Bracket Option Kit	293121-B21
	NOTE: Used to secure one server blade enclosure in a rack when moving.	
	ProLiant BL p-Class Power Enclosure Shipping Bracket Option Kit	365044-B21
	NOTE: Used to secure one power enclosure in a rack when moving.	

HP StorageWorks Modular Smart Array 1000	HP StorageWorks Modular Smart Array 1000	201723-B22
	Modular Smart Array 1000 Controller	218231-B22
	Modular Smart Array Fibre Channel I/O Module	218960-B21
	Modular Smart Array 1000 Fibre Channel Adapter (FCA) 2101	245299-B21
	Modular Smart Array hub 2/3	286763-B21
	NOTE: Please see the Modular Smart Array 1000 QuickSpecs for additional options and configuration information at http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML (North America) http://h18000.www1.hp.com/products/quickspecs/11033_div/11033_div.HTML (Worldwide)	

Options

Controllers and Host Bus Adapters	FCA2101 2Gb PCI FC HBA for Windows	245299-B21	
	FCA2404DC 2Gb PCI-X-to-FC HBA for W2K and Windows Server 2003	233264-B21	
	FCA2404 2Gb PCI-X HBA for W2K and Windows Server 2003	305573-B21	
	FCA2214 2Gb PCI-X FC HBA for Windows and Linux	281541-B21	
	FCA2214DC 2 Gb Dual Channel PCI-X FC HBA for Windows	321835-B21	
Cluster Options	ProLiant Cluster HA/F100 for Modular Smart Array 1000	252408-B24	
	ProLiant Cluster HA/F100 for Modular Smart Array 1000 (Japan)	252408-294	
	NOTE: For additional information regarding the ProLiant Cluster for HA/F100, HA/F200 for Modular Smart Array 1000 please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11035_na/11035_na.html (North America) http://h18000.www1.hp.com/products/quickspecs/11035_div/11035_div.html (Worldwide)		
	ProLiant Cluster HA/F500 Enhanced Kit for EVA 2	254623-B24	
	ProLiant Cluster HA/F500 Basic Kit for EVA 2	313047-B23	
	NOTE: For additional information regarding the HP ProLiant Cluster for ProLiant Cluster HA/F500 for Enterprise Virtual Array please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11055_na/11055_na.html (North America) http://h18000.www1.hp.com/products/quickspecs/11055_div/11055_div.html (Worldwide)		
	ProLiant Cluster HA/F500 Enhanced Kit for MA8000/EMA12000/EMA16000	379937-B27	
	ProLiant Cluster HA/F500 Enhanced DT Kit for MA8000/EMA12000/EMA16000	164227-B25	
	NOTE: For additional information regarding the HP ProLiant Cluster for HA/F500 please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/10232_na/10232_na.html (North America) http://h18000.www1.hp.com/products/quickspecs/10232_div/10232_div.html (Worldwide)		
	StorageWorks Enterprise Modular Array 16000 FC	StorageWorks Director 2/64	286809-B21
		NOTE: Please see the StorageWorks SAN Director 2/64 QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/11003_na/11003_na.HTML (North America) http://h18000.www1.hp.com/products/quickspecs/11003_div/11003_div.HTML (Worldwide)	
USB Options	USB Easy Access Keyboard (carbonite)	DC168B#	
	USB 2-Button Scroll Mouse (carbonite)	DD441B	
	USB Floppy	DC141B	

Options

USB Easy Access Keyboard (Carbonite) Country Key Code

Dash #	Description	Dash #	Description
A2M	ICELAND	ABT	HE
AB0	TAWA	ABU	UK
AB1	KOR	ABV	ARA
AB2	PRC	ABX	FIN
AB6	FRA	ABY	DEN
AB7	GRK	ABZ	ITL
AB8	TURK	AC0	BEL
AB9	PORT	AC4	BRZ
ABA	US	ACB	RUSS
ABB	EURO	AKB	CZE
ABC	FCAN	AKC	HUNG
ABD	GR	AKD	POL
ABE	SP	AKL	THAI
ABF	FR	AKN	BHCSY
ABH	NL	AKR	SLOV
ABJ	Japan	ARK	ICELAND
ABM	LA	B15	KAZ
ABN	NOR	UUZ	SWISS
ABS	SW		

HP Rack 10000 Series (Graphite Metallic)

HP S10614 (14U) Rack Cabinet - Shock Pallet	292302-B22
HP Rack 10842 (42U, 800mm wide) - Pallet	245160-B21
HP Rack 10842 (42U, 800mm wide) - Shock Pallet	245160-B23
HP Rack 10647 (47U) - Pallet	245161-B21
HP Rack 10647 (47U) - Crated	245161-B22
HP Rack 10642 (42U) - Pallet	245161-B23
HP Rack 10642 (42U) - Shock Pallet	245162-B21
HP Rack 10642 (42U) - Crated	245162-B22
HP Rack 10636 (36U) - Pallet	245162-B23
HP Rack 10636 (36U) - Shock Pallet	245163-B21
HP Rack 10636 (36U) - Crated	245163-B22
HP Rack 10622 (22U) - Pallet	245163-B23

NOTE: -B21 (pallet) used to ship empty racks shipped on a truck
 -B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels)
 -B23 (crated) used for air shipments of empty racks

NOTE: Not all HP equipment is qualified to be shipped in the Rack 10000 series.

Rack Options for HP Rack 10000 Series

HP Rack Plinth Kit (Carbon)	251960-B21
HP Rack Light Kit (Neon)	361589-B21
800mm Wide Stabilizer Kit (Graphite)	255488-B21
NOTE: Supported by the Rack 10842 cabinet only.	
600mm Stabilizer Kit – Graphite	246107-B21
Baying Kit for Rack 10000 series (Carbon)	248929-B21
42U Side Panel – Graphite Metallic	246099-B21
110V Fan Kit (Graphite)	257413-B21

Options

NOTE: Roof Mount Includes power cord with IEC320-C13 to Nema 5-15P.

220V Fan Kit (Graphite) 257414-B21

NOTE: Roof Mount Includes power cord with IEC320-C13 to Nema 6-15P.

36U Side Panel – Graphite Metallic 246102-B21

47U Side Panel – Graphite Metallic 255486-B21

9000/10000 Series Offset Baying Kit (42U) 248931-B21

NOTE: This kit can be used to connect 9000 and 10000 series racks of the same U height together. Kit contents include hardware for connecting racks and a panel to cover the 100mm gap at the rear of the two racks.

NOTE: For additional information regarding Rack Options, please see the following URL:
<http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html>.

Ballast Option Kit 120672-B21

9000/10000 Series Offset Baying Kit (42U) 248931-B21

NOTE: This kit can be used to connect 9000 and 10000 series racks of the same U height together. Kit contents include hardware for connecting racks and a panel to cover the 100mm gap at the rear of the two racks.

NOTE: For additional information regarding Rack Cabinets, please see the following URL:
<http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html>

Rack Rail Adapter Kit (25" depth) 120675-B21

100 kg Sliding Shelf 234672-B21

Monitor/Utility Shelf - Graphite 253449-B21

Depth Adjustable Fixed Rail 332558-B21

Cable Management D-Rings Kit 168233-B21

Server Console Switch 1 x 4 port (100-230 VAC) 400336-001

Server Console Switch 1 x 4 port (100-230 VAC) (Int'l) 400336-B31

Server Console Switch 1 x 4 port (100-230 VAC) (Japan) 400336-291

IP Console Switch Box, 1 x 1 x 16 262585-B21

IP Console Switch Box, 3 x 1 x 16 262586-B21

CPU to Server Console Cable, 12' 110936-B21

CPU to Server Console Cable, 3' 110936-B24

CPU to Server Console Cable, 7' 110936-B25

IP CAT5 Cable 3', 4 pack 263474-B21

IP CAT5 Cable 6', 8 pack 263474-B22

IP CAT5 Cable 12', 8 pack 263474-B23

IP CAT5 Cable 20', 4 pack 263474-B24

IP CAT5 Cable 40', 1 pack 263474-B25

Switch Box Connector Kit (high voltage) (Int'l) 144007-B33

TFT5600 Rack Keyboard Monitor 221546-xx1

TFT7210R Rack Mounted 17" Monitor 348373-B21

NOTE: For a complete list of Monitors please view the following URL:
<http://h18004.www1.hp.com/products/monitors/>

1U Rack Keyboard & Drawer (Carbon) 257054-xx1

Country Code Key (for 1U Rack Keyboard & Drawer (PN 257054-xx1))

XX = 001	US	XX = 091	Norway
XX = 031	UK	XX = 101	Sweden/Finland
XX = 041	Germany	XX = 111	Switzerland
XX = 051	France	XX = 131	Portugal
XX = 061	Italy	XX = 181	Belgium
XX = 071	Spain	XX = 291	Japan
XX = 081	Denmark	XX = B31	International

Options

NOTE: For additional information regarding Rack Options, please see the following URL:
<http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html>.

Rack Options for Telco Racks	Bus Bar Telco Rail Option Kit	245249-B21
	Enclosure Telco Rail Option Kit	266076-B21

Service and Support Offerings (HP Care Pack Services)

NOTE: The HP Care Pack services for ProLiant BL p-Class server blades, cover the server blade and the p-Class blade enclosure that the server blade is installed in as well as interconnects, power enclosure with power supplies and power distribution.

Hardware Services On-site Service

Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years UA203A

Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic UA203E

4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years UA204A

4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic UA204E

4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years UA205A

4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic UA205E

6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years UA206A

6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic UA206E

Installation & Start-up Services

ProLiant BL p-Class Blade Server Hardware Installation UA219A

ProLiant BL p-Class Blade Server Hardware Installation, Electronic UA219E

ProLiant BL p-Class Enclosure and Server Blade Hardware Installation UA4971A

ProLiant BL p-Class Enclosure and Server Blade Hardware Installation, Electronic UA4971E

Provides for the Installation and Start-up of Compaq's Rapid Deployment Pack on a Customer supplied server designated as a Deployment Server. Includes the deployment of a single server. This new server will be deployed using either one of the pre-configured scripts or an image. In addition, the service will provide for the capture and storage of the configuration of the newly deployed server and orientation on product usage. To be delivered during standard office ours, standard office days. U5683A

Provides for the Installation and Start-up of Compaq's Rapid Deployment Pack on a Customer supplied server designated as a Deployment Server. Includes the deployment of a single server. This new server will be deployed using either one of the pre-configured scripts or an image. In addition, the service will provide for the capture and storage of the configuration of the newly deployed server and orientation on product usage. To be delivered during standard office ours, standard office days. Electronic. U5683E

NOTE: For more information, customer/resellers can contact
<http://www.hp.com/hps/carepack/services/>

Memory

ProLiant BL40p Server Blade (2P Model)
Standard Memory

1024-MB of 2-way interleaved PC2100 ECC DDR installed (2 x 512-MB SDRAM DIMM)

Standard Memory Plus Optional Memory

Up to 9216-MB of 2-way interleaved PC2100 ECC DDR memory is available with the installation of optional DDR DIMM memory expansion kits.

Standard Memory Replaced with Optional Memory

Up to 12288-MB of 2-way interleaved PC2100 ECC DDR memory is available with the removal of standard memory and the installation of optional DDR DIMM memory expansion kits.

Memory		Slot					
		1	2	3	4	5	6
Standard	1,024MB	512 MB	512 MB	Empty	Empty	Empty	Empty
Optional	9,216MB	512 MB	512 MB	2048 MB	2048 MB	2048 MB	2048 MB
Maximum	12,288 MB	2048 MB	2048 MB	2048 MB	2048 MB	2048 MB	2048 MB

Following are memory options available from HP:

- 2512MB of PC2100 ECC DDR DIMM Memory Kit (2x256MB)
 - 1024MB of PC2100 ECC DDR DIMM Memory Kit (2x512MB)
 - 2048MB of PC2100 ECC DDR DIMM Memory Kit (2x1024MB)
 - 4096MB of PC2100 ECC DDR DIMM Memory Kit (2x2048MB)
- 300678-B21

300679-B21

300680-B21

300682-B21

ProLiant BL40p Server Blade (1P Model)
Standard Memory

512MB of 2-way interleaved PC2100 ECC DDR installed (2 x 256-MB SDRAM DIMM)

Standard Memory Plus Optional Memory

Up to 8704-MB of 2-way interleaved PC2100 ECC DDR memory is available with the installation of optional DDR DIMM memory expansion kits.

Standard Memory Replaced with Optional Memory

Up to 12288-MB of 2-way interleaved PC2100 ECC DDR memory is available with the removal of standard memory and the installation of optional DDR DIMM memory expansion kits.

Memory		Slot					
		1	2	3	4	5	6
Standard	512MB	256 MB	256 MB	Empty	Empty	Empty	Empty
Optional	4,608MB	256 MB	256 MB	2048 MB	2048 MB	2048 MB	2048 MB
Maximum	12,288MB	2048 MB	2048 MB	2048 MB	2048 MB	2048 MB	2048 MB

Following are memory options available from HP:

- 512MB of PC2100 ECC DDR DIMM Memory Kit (2x256MB)
 - 1024MB of PC2100 ECC DDR DIMM Memory Kit (2x512MB)
 - 2048MB of PC2100 ECC DDR DIMM Memory Kit (2x1024MB)
 - 4096MB of PC2100 ECC DDR DIMM Memory Kit (2x2048MB)
- 300678-B21

300679-B21

300680-B21

300682-B21

Technical Specifications

HP ProLiant BL p-Class Server Blade Enclosure	Dimensions	Height	10.5 in (26.67 cm)
		Width	17.60 in (44.70 cm)
		Depth	28.86 in (73.30 cm)
	Input Specifications	Rated input voltage	-43 VDC to -53 VDC Nominal -48 VDC
		Rated input current	62.5 A at -48 VDC
		Rated input Power	3000 W
	Individual server blade bay ratings	Rated input voltage	-43 VDC to -53 VDC Nominal -48 VDC
		Rated input current	6.25 A at -48 VDC
		Rated input Power	300 W
	Temperature range	Operating	50° to 95° F (10° to 35° C)
		Non-Operating	-22° to 140° F (-30° to 60° C)
	Relative humidity (non-condensing)	Operating	20% to 80%
		Non-Operating	5% to 95%
	Wet bulb temperature	Operating	82.4° F (28° C)
		Non-Operating	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Operating and Performance Specifications for ProLiant BL40p Server Blade	Dimensions	Height	1.69 in (4.29 cm)
		Width	10.29 in (26.14 cm)
		Depth	28.00 in (71.12 cm)
	Weight (maximum)	18.0 lb (8.17 kg)	
	Temperature range	Operating	50° to 95° F (10° to 35° C)
		Non-operating	
		Shipping	-40° to 140° F (-40° to 60° C)
		Storage	-4° to 140° F (-20° to 60° C)
	Relative humidity (non-condensing)	Operating	10% to 90%
		Non-operating	
		Shipping	10% to 90%
		Storage	10% to 95%
	Maximum wet bulb temperature	82° F (28° C)	

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Technical Specifications

Operating and Performance Specifications for RJ-45 Patch Panel 2 with Fibre Channel pass through	Dimensions	Height	10.405 in (26.43 cm)
		Width	1.535 in (3.899 cm)
		Depth	27.697 in (70.35 cm)
	Capability	IEEE 802.2, 802.3, 802.3u	
	Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
		10 Base-T (full-duplex)	20 Mbps
		100 Base-TX (half-duplex)	100 Mbps
		100 Base-TX (full-duplex)	200 Mbps
		1000 Base-TX (full-duplex)	1000 Mbps
	Connector	Network	RJ-45 in the back
		Fibre Channel SAN	Pluggable SFP optical slot in the front
	Cable Support	10 Base-TX	Categories 3, 4, or 5 UTP (2 or 4 pair); up to 328 ft (100 m)
		100 Base-TX	Category 5 UTP (2 pair); up to 328 ft (100 m)
		1000 Base-TX	Category 5E (4 pair); up to 328 ft (100 m)
	Power requirements	200 mA at + 5V DC; 500 mA at -48V	
	Temperature range	Operating	50° to 95° F (10° to 35° C)
		Non-operating	-22° to 140° F (-30° to 60° C)
	Relative humidity (non-condensing)	Operating	20% to 80%
		Non-operating	5% to 95%
	Wet bulb temperature	Operating	82.4° F (28° C)
		Non-operating	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Technical Specifications

Operating and Performance Specifications for RJ-45 Patch Panel

Dimensions	Height	10.405 in (26.43 cm)
	Width	1.535 in (3.899 cm)
	Depth	27.697 in (70.35 cm)
Capability	IEEE 802.2, 802.3, 802.3u	
Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
	10 Base-T (full-duplex)	20 Mbps
	100 Base-TX (half-duplex)	100 Mbps
	100 Base-TX (full-duplex)	200 Mbps
	1000 Base-TX (full-duplex)	1000 Mbps
Connector	RJ-45	
Cable Support	10 Base-TX	Categories 3, 4, or 5 UTP (2 or 4 pair); up to 328 ft (100 m)
	100 Base-TX	Category 5 UTP (2 pair); up to 328 ft (100 m)
	1000 Base-TX	Category 5E (4 pair); up to 328 ft (100 m)
Power requirements	200 mA at + 5V DC; 500 mA at -48V	
Temperature range	Operating	50° to 95° F (10° to 35° C)
	Non-operating	-22° to 140° F (-30° to 60° C)
Relative humidity (non-condensing)	Operating	20% to 80%
	Non-operating	5% to 95%
Wet bulb temperature	Operating	82.4° F (28° C)
	Non-operating	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Technical Specifications

Operating and Performance Specifications for GbE2 Interconnect Switch	Dimensions	Height	10.405 in (26.43 cm)
		Width	1.535 in (3.899 cm)
		Depth	27.697 in (70.35 cm)
	Weight	12.0 lb/5.4 kg per interconnect switch	
	Performance	24 Gbps External port bandwidth per server blade enclosure (full duplex)	
		Forwarding rate 1.5 million pps per gigabit port (64-byte packets)	
		Auto-MDI/MDIX, auto-negotiation and auto-sensing with full-duplex support	
	Forwarding Mode	Store and forward	
	MAC Addresses	2,048 per interconnect switch	
	Forwarding table age time	Maximum age: 1 to 65535 seconds; default: 300 seconds	
	Memory	128MB Main, 32MB flash and 2MB packet buffer per interconnect switch	
	Compliance	IEEE 802.3, 802.3u, 802.3ab, 802.3x, 802.3z (F-GbE2 only), 802.1D, 802.1s, 802.3ac, 802.3ad (Static), and 802.1Q	
		SNMP v1 (RFC 1157), MIB-II (RFC 1213), Bridge MIB (RFC 1493), Interface Group MIB (RFC 2863), Ethernet MIB (RFC 1643), 802.1Q Extended Bridge MIB, Entity MIB (RFC 2037), RADIUS Authentication MIB, 802.3-2002 MIB, SNMP Trap Convention (RFC 1215), Bridge Trap (RFC 1493), Remote Monitoring Traps (RFC 1757) and HP Enterprise Switch MIBs and Environmental Traps	
		RADIUS (RFC 2138), Telnet (RFC 854), TFTP client (RFC 783), SSH v1.5, SCP v1.5, NTP v2 (RFC 1119), BOOTP client (RFC 2132), and XModem	
	Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
		10 Base-T (full-duplex)	20 Mbps
		100 Base-TX (half-duplex)	100 Mbps
		100 Base-TX (full-duplex)	200 Mbps
		1000 Base-TX (half-duplex)	1000 Mbps
		1000 Base-TX (full-duplex)	2000 Mbps
		1000 Base-SX (full-duplex)	2000 Mbps
	Connector	12 RJ-45, 2 DB-9 (C-GbE2 Interconnect Kit) 8 LC fiber, 4 RJ-45, 2DB-9 (F-GbE2 Interconnect Kit)	
	EMI	FCC Class A	
		ICES-003 Class A	
		AS/NZS 3548 Class A	
	Safety	VCCI Class A	
		UL/CUL Listed Accessory	
	Power Requirements	CE	
		-48VDC: 2040 mA, 98 W maximum (per interconnect switch without GbE2 Storage Connectivity Kit) -48VDC: 2355 mA, 113 W maximum (per interconnect switch with GbE2 Storage Connectivity Kit)	
	Temperature Range	Operating	50° to 95° F (10° to 35° C)
		Non-operating	-22° to 140° F (30° to 60° C)
	Relative humidity (non-condensing)	Operating	20% to 80%
		Non-operating	5% to 95%
	Wet Bulb Temperature	Operating	82.4° F (28° C)
		Non-operating	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F/1° C per 1,000 ft/304.8 m. No direct sunlight. Upper operating limit is 10,000 ft/3,048 m or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft/9,144 m or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F/45° C. Altitude maximum for storage is 70 KPa.

Technical Specifications

Operating and Performance Specifications for GbE Interconnect Switch	Dimensions	Height	10.41 in (26.43 cm)
		Width	1.54 in (3.9 cm)
		Depth	27.7 in (70.35 cm)
	Weight	11.5 lb/5.2 kg per interconnect switch	
	Performance	9.6 Gbps external port bandwidth per server blade enclosure (full duplex)	
		Forwarding rate 0.15 million pps per 10/100 port, 1.5 million pps per gigabit port, (64-byte packets)	
		Non-blocking, full-wire speed for all connections	
		Auto-MDI/MDIX, auto-negotiation and auto-sensing with full-duplex support	
	Forwarding Mode	Store and forward	
	MAC Addresses	8,191 per interconnect switch; MAC address based filtering and MAC address packet priority configuring	
	Forwarding table age time	Maximum age: 1 to 1,000,000 seconds; default: 300 seconds	
	Memory	32MB Main, 6MB flash and 16MB packet buffer per interconnect switch	
	Compliance	IEEE 802.3, 802.3u, 802.3ab, 802.3z, 802.1D, 802.1p, 802.3ac, 802.3ad (Static), 802.1Q, and 802.3x	
		SNMP v1 (RFC 1157) and RMON v1 (RFC 1757) groups 1, 2, 3, and 9	
		MIB-II (RFC 1213), Bridge MIB (RFC 1493), Interface Group MIB (RFC 2863), Ethernet MIB (RFC 1643), 802.1Q Extended Bridge MIB (RFC 2674), Entity MIB (RFC 2037), SNMP Trap Convention (RFC 1215), Bridge Trap (RFC 1493), Remote Monitoring Traps (RFC 1757), and HP Enterprise Switch MIBs and Environmental Traps	
		IGMP v1 (RFC 1112), IGMP v2 (RFC 2236), SNTP (RFC 1361), Telnet (RFC 854), TFTP client (RFC 783), BOOTP client, (RFC 2132), DHCP client, (RFC 2131) and ZModem	
	Network transfer rate	10 Base-T (half-duplex)	10 Mbps
		10 Base-T (full-duplex)	20 Mbps
		100 Base-TX (half-duplex)	100 Mbps
		100 Base-TX (full-duplex)	200 Mbps
		1000 Base-TX (half-duplex)	1000 Mbps
		1000 Base-TX (full-duplex)	2000 Mbps
		1000 Base-SX (full-duplex)	2000 Mbps
	Connector	12 RJ-45, 2 DB-9 (C-GbE Interconnect Kit)	
		4 LC fiber, 8 RJ-45, 2 DB-9 (F-GbE Interconnect Kit)	
	EMI	FCC Class A	
		ICES-003 Class A	
		AS/NZS 3548 Class A	
		VCCI Class A	
	Safety	UL/CUL Listed Accessory	
		CE	
	Power Requirements	48V: 1050 mA, 50 W maximum (per interconnect switch)	
	Temperature Range	Operating	50° to 95° F (10° to 35° C)
		Non-operating	-22° to 140° F (-30° to 60° C)
	Relative humidity (non-condensing)	Operating	20% to 80%
		Non-operating	5% to 95%
	Wet bulb temperature	Operating	82.4° F (28° C)
		Non-operating	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Technical Specifications

Operating and Performance Specifications for Power Enclosures (North America/Japan)			Single-Phase Model	Three-Phase Model
	Dimensions	Height	5.25 in (13.34 cm)	5.25 in (13.34 cm)
		Width	27.15 in (68.96 cm)	27.15 in (68.96 cm)
		Depth	17.60 in (44.7 cm)	17.60 in (44.7 cm)
	Weights	No hot-plug power supplies	47.5 lb (21.55 kg)	47.5 lb (21.55 kg)
		All hot-plug power supplies	99.5 lb (45.13 kg)	125.5 lb (56.93 kg)
	Input requirements	Rated input voltage	200 VAC to 240 VAC	200 VAC to 240 VAC line to line
		Rated input frequency	50 Hz to 60 Hz	50 Hz to 60 Hz
		Rated input current per side	24A	24A per phase
		Rated input power per side	5760 W	9976 W
		Power cord	1 NEMA L6-30P per side	1 NEMA L15-30 per side
		Rated output voltage	-48.8 VDC to -54 VDC	-48.8 VDC to -54 VDC
	Output voltage specifications	Rated output current	99A	170A
		Rated output power	4298 W	8310 W
		Nominal power	4158 W at 208 VAC	7202 W at 208 VAC
		Operating	50° to 95° F (10° to 35° C)	50° to 95° F (10° to 35° C)
	Ambient temperature range (See NOTE)	Shipping	-22° to 140° F (-30° to 60° C)	-22° to 140° F (-30° to 60° C)
		Operating	20% to 80%	20% to 80%
	Relative humidity, non-condensing (See NOTE)	Non-operating	5% to 95%	5% to 95%
		Operating	82.4° F (28° C)	82.4° F (28° C)
	Wet bulb temperature	Non-operating	101.7° F (38.7° C)	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Technical Specifications

Operating and Performance Specifications for Power Enclosures (International)			Single-Phase Model	Three-Phase Model
	Dimensions			
	Dimensions	Height	5.25 in (13.34 cm)	5.25 in (13.34 cm)
		Width	27.15 in (68.96 cm)	27.15 in (68.96 cm)
		Depth	17.60 in (44.7 cm)	17.60 in (44.7 cm)
	Weights	No hot-plug power supplies	47.5 lb (21.55 kg)	47.5 lb (21.55 kg)
		All hot-plug power supplies	99.5 lb (45.13 kg)	125.5 lb (56.93 kg)
	Input requirements	Rated input voltage	200 VAC to 240 VAC	200 VAC to 240 VAC line to line
		Rated input frequency	50 Hz to 60 Hz	50 Hz to 60 Hz
		Rated input current per side	24A	24A per phase
		Rated input power per side	5760 W	10,552 W
		Power cord	1 IEC 309 3-pin, 32A per side	1 IEC 309 5-pin, 32A per side
		Rated output voltage	-48.8 VDC to -54 VDC	-48.8 VDC to -54 VDC
		Rated output current	99A	180A
		Rated output power	4798 W	8790 W
		Nominal power	4598 W at 208 VAC	8790 W at 208 VAC
	Ambient temperature range (See NOTE)	Operating	50° to 95° F (10° to 35° C)	50° to 95° F (10° to 35° C)
		Shipping	-22° to 140° F (-30° to 60° C)	-22° to 140° F (-30° to 60° C)
	Relative humidity, non-condensing (See NOTE)	Operating	20% to 80%	20% to 80%
		Non-operating	5% to 95%	5% to 95%
	Wet bulb temperature	Operating	82.4° F (28° C)	82.4° F (28° C)
		Non-operating	101.7° F (38.7° C)	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Technical Specifications

Operating and Performance Specifications for Power Distribution Devices	Power Bus Box	Mini Bus Bar	Scalable Bus Bar
Power enclosures or facility DC feeds supported (3U each)	1	1	2
Server blade enclosures supported (6U each)	1	3	5
Total rack height of supported enclosures	9U	21U	36U
Dimensions			
Height	5.1 in (12.95 cm)	19.45 in (49.40 cm)	48.57 in (123.37 cm)
Width	3.6 in (9.14 cm) each	19.74 in (50.14 cm)	19.74 in (50.14 cm)
Depth	3.25 in (8.26 cm)	2.2 in (5.59 cm)	2.2 in (5.59 cm)
Weight	3.62 lb (1.64 kg)	13.2 lb (5.9 kg)	26 lb (11.79 kg)
Rated operating voltage	-43.2 VDC to -54 VDC	-43.2 VDC to -54 VDC	-43.2 VDC to -54 VDC
Max total power supported	3000 W	9000 W	15,000 W
Total max input current at minimum voltage	69.44 A at -43.2VDC	208.32 A at -43.2 VDC	347.2 A at -43.2 VDC (equivalent of 175A per feed)
Total max input current at nominal voltage	62.5 A at -48VDC	187.5 A at -48 VDC	312.5 A at -48 VDC (equivalent of 175A per feed)
Max current per power feed	70A	210A	210A
Max local ambient temperature	149° F (65° C)	149° F (65° C)	149° F (65° C)

NOTE: All systems support redundant A & B feeds. Scalable bus bar supports dual A and dual B feeds.

Technical Specifications

Operating and Performance Specifications for Facility DC	Voltage	Nominal input voltage	-48 VDC
		Operating voltage range	-48VDC $\pm$ 10% or -43.2 VDC to -52.8 VDC
		Max Input voltage slew rate	0.5V/uS
		Redundant feed voltages* (A & B)	*A and B feeds must differ by no more than 5VDC during steady state operation
		Ripple/Noise	480 mV PARD**
		Overshoot	Must remain within regulation limits on all feeds during startup or shutdown
	Current	Voltage transients	Must not exceed -60 VDC
		Max steady state input current	62.5A per server blade enclosure installed at -48VDC
		Max steady state current per feed/total	
		Power bus boxes	70 A/70A
		Mini bus bars	210 A/210A
		Scalable bus bars	210 A/350A or equivalent of 175A per feed*
	In-rush current	Must support up to 2X the maximum operating current per server blade enclosure (125 A) for up to 1.0 mS	
	Input over-current	Customer provided fusing for facility DC feeds that protects the system from catastrophic over-current within 20 uS. Fuse should sustain all in-rush and operating currents.	
	Max Input Current Slew Rate	1A/uS	
	Max Rated Power	3000W per server blade enclosure	
	Connections and Cables	HP provided facility DC cable connection kit:	
		The facility DC connection kit supports the connection of up to four -48VDC, RETURN pairs and ground.	

The power cable assemblies consist of 1/0AWG, color-coded, flexible cable rated at 105° C, terminated with bus mating connectors at one end and unterminated at the other end. The cable length provided enables the customer to route to a fuse panel within or adjacent to the rack.

NOTE: *All systems support redundant A and B feeds. Scalable bus bars support dual A and dual B feeds.

** Periodic and random noise (PARD). Maximum allowable peak-to-peak ripple and noise (as measured at the load on any output channel). The ripple and noise is measured over a 20 Hz to 100 MHz frequency band. A resistive load (non-electronic) is used for this measurement. Each output is by-passed to return by a 10uF tantalum capacitor with an ESR less than 100 milli-Ohms in parallel with a 0.47 uF ceramic capacitor, at the point of load. The load cable is 12 feet of twisted wire capable of carrying the current. The printed wiring board assembly is installed in its enclosure for this measurement, or the measurement leads are properly shielded with Earth grounds applied to the insert.

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